

Yield loss associated with floury leaf spot in common beans in Uganda

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Floury leaf spot (FLS) caused by Mycovellosiella phaseoli on beans is amongst the diseases that have previously been ranked as minor in Uganda but has become very prevalent in recent years (1). The disease appears at about pod formation in both low and high altitude areas of Uganda. When severe FLS causes premature leaf defoliation and pod abortions.

A study to determine the yield loss on beans associated with Floury leaf spot was carried out for three seasons 1993A, 1993B and 1994A in Uganda using three bean varieties and three chemical treatments. The varieties were PIE 129 (intermediate), MCM 5001 (intermediate) and K20 (susceptible). The chemicals included benomyl, Kocide 101 and water. The plots were laid out in a split plot design and plot sizes were 10 x 10 m. FLS was assessed weekly for incidence and severity from preflowering to physiological maturity. Pod counts were made weekly from pod formation to Pysiological maturity. The percentage of filled pods were determined and regression analysis was carried out to determine the yield loss associated with FLS. The intercept of the regression equation was considered as the best estimate of the maximum attainable yield.

The effect of FLS on yield was dependent on the susceptibility of the genotype, stage of growth and season. Regression analyses showed that the highest loss in yield of beans due to FLS occurred if the disease was severe at pod filling stage (R8). It was however observed that when this disease set in at flowering or preflowering stage the loss was higher than when the disease set in at pod formation or pod filling stage. Yield loss ranged from not significant for PIE 129 to 27.8% loss of K.20 (Table 1).

There was significant $P \leq 0.05$) and negative correlation ($r = 0.74$) between disease severity (and incidence) and percentage number of filled pods; and percentage number of unfilled pods and yield.

References

1. Opio A.F. 1993. Studies on floury leaf spot. In: Uganda National bean Programme Annual Report (compiled by Fina Opio), Ministry of Agriculture Animal Industry and Fisheries, Kawanda Research Institute, pp 146-154.

Table 1: Severity of Flourey leaf spot and yield loss associated with three genotypes of Phaseolus vulgaris at Kawanda (in 1993) and Namulonge (in 1994) in Uganda.

Genotype	Growth stage	Season	b ^a	Severity	MAY ^b	Total loss in yield in kg/ha	Percentage loss in yield
K.20	Pod filling (R8)	1993A	-22.9	12	1392	274.8	19.7
		1993B	-11.9	8	850	95.2	10.8
		1994A	-25.9	19	1536	492.1	27.8
MCM 5001	Pod filling (R8)	1993A	-12.7	10	2750	127	4.6
		1993B	- 8.4	4	2250	33.6	1.4
		1994A	-16.6	12	2400	199.2	8.3
PIE 129	Pod filling (R8)	1993A	-10.5	7	2640	73.5	2.8
		1993B	- 7.2	3	2100	21.6	1.0
		1994A	-14.5	9	2830	130.5	4.6

^ab is the slope (regression) coefficient indicating the reduction in yield for every unit increase in disease severity.

^bMAY Maximum attainable yield (intercept).

Total yield loss = b x severity

% yield loss = $\frac{b \times \text{severity}}{\text{MAY}}$